



The Earth Science
DIGEST

AUGUST 1946

A SUPPLIER OF GEOLOGICAL MATERIALS

Ward's for over eighty years has been the reliable source for geological material for the science teacher, mineralogist, geologist, paleontologist, investigator and collector.

If you require a piece of characteristic granite for an elementary student, you can get it from Ward's for as low as ten cents, or if you want a \$100.00 diamond crystal Ward's will supply it.

Ward's knows what the teacher requires for teaching the geological sciences because we have made it our business for 84 years... We procure typical and characteristic examples of minerals, rocks and fossils from world-wide sources.

Ward's prepared collections of minerals, rocks and fossils are used extensively for teaching in progressive educational institutions.

SEND FOR FREE CATALOGS

#444 MINERALS AND ROCKS

A 44-page listing of mineral specimens for study, pound material, rocks and soils. This catalog is for teachers only and would not be of interest to individual collectors.

#443 MINERAL, ROCK AND FOSSIL COLLECTIONS

27 pages of collections useful in the teaching of mineralogy, geology, and paleontology.

#466 FINE MINERAL SPECIMENS

This is an annual price list of individual mineral specimens suitable for the collector or the museum exhibit.

#451 MINERAL SUPPLIES

This includes trays and other storage supplies, books, and fluorescent lamps. Also contains a listing of all fluorescent minerals. This catalog will be of interest to collectors, museums, colleges and universities.

WARDS NATURAL SCIENCE ESTABLISHMENT, INC.

P. O. Box 24

Beechwood Station

ROCHESTER 9, NEW YORK

Please send THE EARTH SCIENCE DIGEST for the period indicated below

— 12 issues per year. Bill me later.

1 yr. \$2.00 2 yrs. \$3.75 3 yrs. \$5.00

Name.....

Address

City..... Zone..... State.....

ADDITIONAL POSTAGE PER YEAR: CANADA 50¢ FOREIGN \$1.00

Postage
Will Be Paid
by
Addressee

No
Postage Stamp
Necessary
If Mailed
in U.S.A.

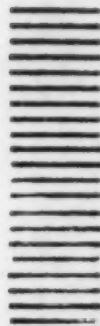
BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 855 SEC. 510 P. L. & R. OMAHA, NEBR.

The Earth Science Digest

P. O. Box 57

Omaha 3, Nebr.



13 113

LAPIDARY Equipment

Diamond Saws, Stones, Abrasives

A complete assortment of lapidary tools, polishes,
and abrasives is now available.

WRITE FOR THE ELCRAFT CATALOGUE OF
SAWS, BORTZ, STONE DRESSERS, NORBIDS, ETC.

“SEROX”

The Wonder Polish, Levigated

$\frac{1}{2}$ lb. \$1.50 lb. \$2.60

Mention “Earth Science”
for prepaid equipment

ELCRAFT

“EVERYTHING FOR HANDICRAFTS”

DENVER 2, COLORADO

The Earth Science Digest

Box 57

Omaha 3, Nebr.

Published monthly by The
Earth Science Publishing Co.

B. H. Bennett Editor.
R. B. Berry Associate
Editor
M. S. Arbogast Circulation &
Business Manager.

SUBSCRIPTIONS

Per copy \$.25
1 year \$2.00
3 years \$5.00

* * * * *

Advertising rate card will be sent upon
request

Vol. I Aug. 1946 No. 1

EDITORIAL

This is the first issue of **The Earth Science Digest**. As the title would imply the magazine will deal with the various earth sciences. Emphasis will be placed upon the human interest side of geology while enough technical matter will be retained to make the magazine valuable for reference use. Articles will be written by authorities in the earth science fields. No effort will be spared to bring to the reader the best material available.

Earth science is a rapidly expanding field. In the past ten years its growth has been nothing short of phenomenal. This growth can be attributed for the most part to the amateur. Over 75 percent of the new discoveries in the fields of mineralogy and paleontology have been made by amateurs armed only with picks, hammers, and a vast amount of patience: We propose to help these people in their valuable work by presenting articles that will serve to guide them in all phases of the field of earth science.

Any suggestions or comments from readers will be appreciated. Letters from readers will be printed from time to time as well as interesting information about their activities. Why not write and tell us how you liked this issue?

LAPIDARY

EQUIPMENT & SUPPLIES

Horizontal Laps
Diamond Saws
Grinding Arbors
Faceting Heads
Cutting Heads
Minerals
Micromounts

Catalog — 10c — Refund
on first order.

LLOYD M. DEMRICK

1424 Frant Ave.

San Francisco 11, Calif.

Please Mention Earth Science Digest

Cover Photograph

Howard Harrell of Omaha, Nebraska, took this imposing view from Angel's Point in The Grand Canyon. A yellow filter was partially responsible for the remarkable composition and depth of the photograph. Mr. Harrell, whose photos have won wide acclaim, spends much of his time photographing subjects of scenic interest.

Letters to the Editor

It will be our future policy to print letters from the readers of **The Earth Science Digest** in this column. Write us and let us know your reaction to the magazine. It is our firm desire to print the type of articles that **YOU** want to read. All letters of criticism will be welcomed by our editorial staff for it is in this manner that we can improve and advance the quality of our publication.



Victor Shaw (right) and friend on the Steam Sealer "Hope". Picture was taken on Perry Relief Expedition of 1897.

NEW POLAR FOSSILS

by Victor Shaw

THE FOSSIL DEPOSIT known as "Silliman Fossil Mount" is situated near the head of Frobisher Bay in southern Baffinland, almost exactly upon the sixty-fourth parallel of north latitude. What makes it remarkable, in the opinion of this writer, is due not so much to its isolated polar position; but rather to the fact that all fossils so far collected were not embedded in an original limestone matrix, but were wholly free and loosely distributed throughout this *lucus natura* — a hill of a few acres, less than three hundred feet high.

It may be of interest to state that our party's visit to the deposit, in August, 1897, was quite incidental to our chief objective. Also, that we were the third organized expedition to enter this 200 mile bay—the second to examine the unique deposit—and the first to explore and map the then unsurveyed southern shore.

The bay was first explored by Sir Martin Frobisher in 1576, in his search for a northwest passage; but he only reached an island halfway up the north

shore, stayed only two weeks, and returned to England with some "black earth" he thought contained gold. He made two more voyages, in 1577 and 1578; but only to the island mentioned, where he merely sought for gold and on his final trip with 15 ships he loaded them with pyrites, the iron sulphide now dubbed "fools gold". Still sure this was the "Passage" he called it "Frobisher Strait".

Much later, in 1860, Charles Francis Hall sailed up this same north shore, on his expedition in search of Sir John Franklin, and went to the Jordan River proving that this was, in fact, a bay. He returned and mapped the south shore by what he saw from that side. He stayed in the vicinity two years, during which he found the fossil deposit and collected specimens, giving the place its present name.

Our party that circum-navigated the bay 37 years later, was composed chiefly of university under-graduates; ten young fellows who were there merely for the hunting, fishing, and adventure. Two of us who were in charge, R. W. Porter and the writer, both of M. I. T. '96, had planned this whale boat journey as a preliminary reconnaissance, in advance of our proposed 3-year exploration of the unmapped Baffinland west coast, and its unknown interior with tribes of Eskimos who never had seen a white man. Also, this writer was to collect specimens of its unknown fauna and birds for the N. Y. Museum of Natural History.

The collegians were taken along to help defray our expedition costs, returning to the States on the "Hope", when she went south in September. Porter and the writer would sledge inland next February. However, our expedition failed for lack of dogs promised by Jensen, in charge of the Cape Haven whaling station where we based. His dogs were dying of distemper and he couldn't loan us boats to reach Cumberland Gulf, where sledge dogs were plentiful. So we returned on the "Hope", planning to make the attempt next year; which also failed.

And that thousand miles of west coast remains unmapped. It is true that McMillan tackled it many years later, taking his ship in via Hudson Strait to Foxe Basin; but he failed to investigate the terrific tides rushing over those uncharted shoals and came close to losing his ship. After that experience, he never tried it again.

We had considered that approach, but the records of all Canadian shipmasters proved that tidal currents, shoals and floe ice from Fury and Hecla Strait were too dangerous, so we settled for a sledge attack overland from the east coast. For this, we had a copy of Hall's **Arctic Researches & Life Among The Esk'mos**, published in 1864, after the return from his first voyage; in this he mentioned the fossil deposit, which he had named for Professor Emeritus Benjamin Silliman, who then held the Yale chair of geography and geology.

So we knew its location near the mouth of the Jordan River, which flows into the bay head from its source in a large interior lake, **Angmakduak** (Esk.) some miles inland. In fact on reaching the head of the bay, we had no trouble in identifying the "Mount", as it is the only hill in the immediate vicinity rising from the surrounding plain.

We camped near the mouth of Jordan River late in the evening of August 19th, in a driving flurry of wind and rain according to the writer's diary record. It was the 9th day after leaving our base at Cape Haven on the southeast coast, for we'd laid over, storm bound, at two camps en route up the north shore, only sailing or rowing 7 days. We had logged 193 miles, guessing from our map at daily mileages between nightly camps ashore. Incidentally, we had two whale boats, one holding our party and impedimenta, the other for three families of the Nugumiut Eskimos, with all their possessions: men, women and children, sealskin tupiks, soapstone lamps, blubber, and six tiny puppies.

Our logged mileage was fairly accurate, if the mapped length of 200 miles is correct. One of our travel-camps was on the mainland behind the island mapped as **Frobisher's Farthest**, about halfway up the bay. Porter and the writer explored this island, while the other lads were hunting caribou, finding many relics 320 years old.

At our Jordan River camp that August, the weather cleared the morning after landing and we remained five days. The first three days, our sportsmen stocked our meat rations by getting caribou, with many eider ducks, and spearing salmon trout in the river pools. Meanwhile, Porter and the writer hiked inland to some distant ridges from which we had a view of the big interior lake and surrounding flat sea of grassy muskeg and tundra. On our return to camp,

we secured a big bull caribou, which completed the writer's group of four specimens.

Hence it was not until the 23rd that we took time to examine the historical fossil deposit about a half mile back from the bay. Our plans included a visit to this "Mount" during our stay, and when we set out the whole party trailed us, eager to get some fine souvenirs of the trip to take back home. Arriving at the low hill, our lack of proper tools proved no bar, for no digging was necessary.

Fossils of all kinds and description lay everywhere upon the ground, all over the gently sloping sides and on the flattish summit. They were all separate clean and detached from matrix, all that we picked up being unbroken and with few if any signs of erosive wear. We scattered out over the hill, finding it roughly oval in shape with its long dimension lying approximately northeast and southwest. Each of us was intent upon securing as many different types as possible, so quite a bit of the several acres exposed was covered. No one paid any attention to the others: all walking slowly with heads bent, stooping swiftly to pick up some new trophy, discarding some for larger or more perfect specimens, in the usual manner of amateur mineral collectors.

None of us knew anything much of paleontology, but some did recognize the trilobites, corals, sponges, and many kinds of mollusk, also types afterward classified as brachiopod, graptolites, foraminifera, radiolaria, with some cystoides. We found no stone lillies, although this writer hunted for them, but they may exist and might have been found had we any means of excavating to expose sub-surface material. Nor did we find any resembling starfish, or sea urchins or fish of any type. But, since there were so many from which to choose, our pockets were soon sagging and a return to camp was indicated.

Back in the States next winter, all specimens were boxed together, but with each collection packaged separately and tagged, then sent for identification to Prof. Charles Schuchert, then paleontologist of the U. S. Geological Survey and assistant curator of the National Museum at Smithsonian Institution. Prof. Schuchert classified them as being Ordovician (Trenton) marine invertebrates. Also, he found a great many wholly new species, which he named for the collect-

Continued on page 16

THE RADIOACTIVE CLOCK

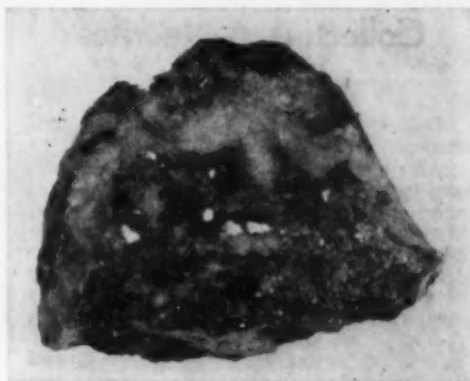
by H. E. Medlow

In recent months a great deal of stress has been placed on the role of uranium in atomic science. Indeed, we may expect this element to play an increasingly important part in the atomic age we are now entering, but one use of uranium has been overlooked in the confusion that followed the first atom bomb explosion. Uranium has given science information about the age and history of the earth that wouldn't have been obtainable from any other source. To be specific, uranium bearing minerals have enabled geologists to definitely establish the age of the oldest known rocks on the surface of the earth at 2,300,000,000 years.

Uranium, unlike other elements, undergoes a steady chemical disintegration. It slowly changes into helium and lead. So slowly does this disintegration take place that one pound of uranium will only yield 1/7,000,000,000 of a pound of lead in one year. The rate of this disintegration is constant, so that if we know the ratio of lead to uranium in a uranium bearing mineral, we can definitely establish the age of the mineral. Now how is it possible to determine the rate of disintegration? There are a number of ways that this can be determined. Perhaps the simplest of these is by the use of a spintharoscope.

The spintharoscope is nothing more than a microscope lens mounted over a zinc sulphide screen. If a small amount of a uranium mineral is placed in the spintharoscope flashes of light may be observed on the screen. This is because every time a uranium atom changes into an atom of helium and an atom of lead, an alpha ray will strike the screen. These flashes may be counted without difficulty. Results of such counts show that in 76,000,000,000 years one pound of uranium would yield one pound of lead. (Assuming total disintegration were possible.) Then if we had a crystal of some uranium bearing mineral such as ellsworthite, by critical chemical analysis we could find the ratio of uranium to lead in the mineral and could calculate the exact age of the mineral.

Extreme care must be used in selecting specimens for analysis. Fresh, unweathered crystals must be used. In



Uranium ore from Hybla, Ontario. The light colored crystals are feldspar and the dark, ellsworthite, containing 15 per cent uranium.

some instances underground water has removed part of the uranium and deposited another element. (Sometimes lead.) This would cause a grave error in our calculations. There is one means, however, by which crystals may be checked to determine if the lead present was derived from uranium. Lead derived from uranium is radioactive, and has a slightly different atomic weight than ordinary lead. By cautious checking it is possible to distinguish the two types of lead. Any thorium present in the crystals must be taken into consideration. Some allowance must be made for the gradual decrease in the amount of uranium present in the crystal over a period of years. This allowance may be introduced into the calculations by use of the binomial theorem.

In some cases pegmatite dikes of comparatively recent age are intrusive into limestone formations of unknown age. By careful study of these intrusions it is sometimes possible to date the limestone formations. For instance, a pegmatite dike near Wray, Colorado cuts through Cretaceous rocks and is overlapped by Oligocene rocks. Analysis of uranium minerals in the dike established the age of the dike at 60,000,000 years. Thus we may say with a fair degree of certainty that the Cretaceous formations cut by the dike are at least 60,000,000 years old. It is not always possible to correlate formations in this manner. A pegmatite dike at Branchville, Connecticut, has yielded uraninite crystals with an age of 350,000,000 years, but the dike lies in a belt of highly

Continued on page 12

Collecting Meteorites

by H. H. Nüniger

It is a great sport to study birds and insects, to hunt fossils and minerals, to learn to know all of the common flowers and trees, and especially to seek out new acquaintances in all of these groups; but rarer than the discovery of a new bird or flower, more exciting than the discovery of a new fossil, is the finding of a new meteorite. A stone which has come wandering among the stars, which, rocket-like, has sailed past planets, moons and asteroids; that has explored millions upon millions of miles of the vast, dizzy reaches of space, and then as a fitting climax to such an adventurous existence, has staged a fiery battle with the atmosphere, triumphantly blazed its trail of fire across the sky and vanished in a glorious burst of flaming splendor to seek obscurity and quiet among the mundane rocks of the earth.

There is not to be found a more romantic chapter in the history of science than that which records man's first acquaintance with these visitors from space. So rarely, indeed, do they come, that even in this modern day more than a hundred and forty years after science learned to recognize them, each new arrival is almost as much of an event as was the first one that was seen to land. Literally millions of people even today, have never knowingly seen a meteorite. And rare though they are, we may safely assert that millions of these "sky-stones" are lying about upon and in the soil of our continent unrecognized. Many of these are on top of the ground. Some have been hauled out of the fields and thrown in rock piles. Doubtless many have been built into stone fences by the pioneer settlers of eastern states. Careful farmers often throw obstructing stones under their fences and into ditches. Several meteorites have been found doing service as weights for the lids of pork barrels, crocks, etc. Some large ones were used for anvils. A friend of mine found a meteorite built into the wall of a city park. I have found the Indians of Ziquipilco in Central Mexico using meteorites as hammers to roughen the grinding surfaces of the metates on which they grind their corn.

How To Recognize Meteorites

Weight: Meteorites are generally heavier than are ordinary rocks in proportion to sizes.

Color: They are dark in color. If lately fallen to the earth they are usually covered with a black crust, regardless of the color of their interior. In the majority of cases the interior is grey and cement-like in appearance, but they are sometimes dark inside as well as outside.

Test: One of the best tests for meteorite identification is the emery wheel test. Simply press a surface of a suspected meteorite against a revolving emery wheel. The ground surface should appear metallic.

After meteorites have lain on or in the soil for a few years and the black crust is changed to a rusty brown color by the formation of iron oxide. Since meteorites do not fall frequently in any locality, it naturally follows that the majority of those to be found are of this brown color and not black as described above. It is therefore most important that you know how to recognize these old residents.

Shape: Meteorites vary greatly in shape. In fact they are liable to be almost any shape except round. However, they are usually characterized by two peculiarities which help in their identification. First, they seldom have sharp corners or edges. This is because the

Continued on page 9

BOOK REVIEW

Revised Lapidary Handbook

by

J. HARRY HOWARD

publi-her

J. HARRY HOWARD

Mr. Howard presents to the amateur lapidist a book that is not too technically involved and yet covers the subject carefully enough to give the reader a fairly concise picture of the field.

His chapter on advancer facet cutting drew particular attention. The presentation of the methods and procedure of this art is particularly good.

A generous number of cuts of drawings and photographs tend to clarify immensely the finer points of the gem cutters' art. This book receives our hearty recommendation as a text for all gem cutters and people in the associated fields.

Ed Note: It will be a policy of this magazine to print reviews of all books on the field of earth science reaching our desk.

THE GEM CUTTERS' CORNER



Brecciated jasper from Stone Canyon, California shown cut and in the rough. The cu. gems were prepared by Mr. Graffham.

Edited by Allen Graffham

Of all the semi-precious gem materials, brecciated jasper is probably as familiar to the thousands of professional and amateur lapidarists as any other American gem. There are several reasons for the popularity of this stone. First, it is colorful and a variety of patterns can be found even in a small piece. Secondly, the rough is free of cracks and flaws. Thirdly, the rough is inexpensive, usually selling at not more than \$1.00 a pound, and can be obtained from any dealer in semi-precious gem materials.

Occurrence — The parent jasper originally was precipitated out along fault lines in the country rock by hydrothermal solutions in the Stone Canyon Area. Later earth movement again occurred along the same fault lines shattering the veins of jasper into millions of small pieces but not displacing them far from their original position. These brecciations thus formed were re-cemented by

another input of water carrying silicon dioxide in solution, but this time precipitating it out in clear and various colored chalcedony.

Yellow is the predominate color of the jasper but brown, green and bright red sometimes do occur. Reds and greens are also found in the chalcedony, sometimes in small areas in the same vein. With these color combinations it can be easily seen that endless cutting variety can be presented by this material.

Suggestions for Cutting — Since this material is both translucent and opaque in the same small piece, the best results in cabochon cutting can be obtained by working with thin stones. Three-sixteenths of an inch is the best slab thickness lending a slightly thinner cabochon when finished. Rounds, squares, and ovals turn out equally well in this rough.

Ed Note: Mr. Graffham's column will appear as a regular feature in our future issues.

LEE LAPIDARIES

Semi-precious and precious stones. Any style facet cutting of natural and synthetics. Also cabochons and other lapidary work. Any quantity.

Inquiries promptly answered

1916 West 75th St.—Cleveland 2, Ohio

Mineral Collectors

We carry a large stock of mineral specimens for either the beginner or advanced collector.

Write us your wants or ask for a price list.
Reasonable Prices

ROBERTS & STEVENS

1106 W. Newmark — Monterey Park, Calif.

ELEMENTS OF GEOLOGY

By Robert B. Berry

Part I Minerals and Rocks

Geology is a history of the earth and its inhabitants. It serves to interpret the records that are present in the rocks, minerals, and soils that make up the outer crust of the earth. In order to acquire a thorough understanding of geology it is essential that we first make a study of the ways by which these rocks, minerals and soils were formed.

ROCKS

Most rocks are coarse aggregates of minerals. They may differ widely in composition and appearance. The most practical way of classifying them is by mode of origin. The three main subdivisions are: I - Igneous rocks; II - Sedimentary rocks; III - Metamorphic rocks.

Igneous rocks are derived by the solidification of molten rock matter called **magma**. The texture and grain of the rock are determined by the time it takes the **magma** to cool. Lava erupted from a volcano cools rapidly and results in a glassy rock such as obsidian. If the lava is cooled below the surface it results in a plutonic rock such as granite or basalt. It is possible to tell from looking at the texture of a piece of granite about how long it took for the rock to cool. The slower it takes the **magma** to cool, the coarser the grain size will be.

Sedimentary rocks are formed by the action of water. There are three types of sedimentary rocks: I - **Mechanical sediments**, such as clays, sandstones, shales, etc.; II - **Chemical sediments**, such as rock salt, gypsum, cave deposits, etc.; III **Organic sediments**, such as chalk, shell limestone, and coral formations. **Mechanical sediments** are deposits that have been deposited under water or in moist places. For instance, shale is the result of a water born mud that has been deposited and allowed to harden over millions of years. Sandstone is sometimes the result of wind-blown sand that has been deposited in shallow water or in a very moist place. Over a period of time water born minerals have tended to cement the sand grains together. **Chemical sediments** are usual-

ly deposited by mineral bearing water. A typical example would be the rock crystals commonly found in limestone caves. Stalactites and stalagmites are formed in this manner. **Organic sediments** are formed by the deposit of the hard parts of lime secreting sea animals. Most limestone was formed in this manner. Several million years ago most of the earth was covered by water. During the time a given land area was submerged, a great deal of sediment was deposited. This sediment later hardened into the limestones that underly most of the land masses on the earth at the present time.

Sedimentary rocks offer the geologist the most and in correlating the earth's history because most of them contain fossils which serve to identify the formations in which they are found. Because of erosion, outcrops of sedimentary rocks can be found in numerous places.

Metamorphic rocks are created by the alteration of igneous and sedimentary rocks. This is usually caused by intense heat in the presence of moisture. Typical examples of metamorphic rocks are: gneiss, mica-schist, marble, slate, etc. Marble is usually a limestone that has undergone changes in texture due to heat and pressure. Slate is shale that has been subject to similar changes.

All of the above mentioned rocks have valuable commercial uses. Of the igneous rocks granite is the most important. Of the sedimentary rocks limestone and sandstone are most useful for building purposes. Of the metamorphic rocks, marble and onyx are used extensively for decorative purposes. The geographic occurrence of these rocks is of great influence on any nation's economy.

MINERALS

A mineral is an inorganic substance formed by nature and has a definite chemical composition. Most minerals are of a crystalline form, although there are a few exceptions. Minerals that don't possess a crystallographic form are called amorphous minerals. Most minerals are made up of two or more elements. A few such as the diamond, graphite, and free metals, are composed of only one element. Even though the diamond and graphite are identical in chemical composition, they are classed as different minerals because their external form varies radically. The diamond is the hardest substance known, whereas graphite is one of the softest substances known.

The best way to identify common minerals is by physical properties. The streak or powder color test is about the most important. The powders of minerals have distinctive and determinative colors. By rubbing the mineral to be tested on white, unglazed piece of porcelain, the color may be observed. If unglazed porcelain isn't available, a white quartz pebble or an unglazed tile will do. Dark streaks indicate metallic minerals and light streaks indicate non-metallic minerals. To check the hardness of a mineral merely make a scratch test using a mineral of known hardness. Listed below are minerals with hardness from (1) to (10).

1. Talc. Easily scratched by a finger nail.
2. Gypsum. Scratched by a strong thumb nail or coin.
3. Calcite. Not scratched by a finger nail, but readily scratched by the point of a knife.
4. Fluorite. Scratched by a knife. Will scratch calcite or a coin.
5. Apatite. Barely scratched by a knife blade, but can usually be scratched by opal.
6. Orthoclase. Not scratched by a knife blade. Can be scratched by a file. A common file equals 6.5.
7. Quartz. Cuts glass deeply. Not scratched by a knife or file.
8. Topaz. Will scratch quartz.
9. Corundum. Will scratch topaz or beryl.
10. Diamond. Will scratch any mineral. Is scratched by nothing.

References

- Outlines of Geology**, Longwell, Knopf, Flint, Schuchert, Dunbar.
- College Geology**, by Salisbury and Chamberlin.
- The Common Rocks**, by E. H. Barbour.
- The Common Minerals**, by E. H. Barbour.

Ed. Note: This is the first of twelve articles by Mr. Berry dealing with the fundamentals of geology. The September article will be entitled "Erosion".

From page 6 COLLECTING METEORITES

extreme heat of friction when coming through the atmosphere burns off any sharp points or edges, leaving them dull or rounded. Secondly, meteorites are often pitted. They have shallow depressions that are similar to the marks caused by pressing your fingers into a ball of clay or putty. Occasionally a meteorite is found cone-shaped. This is due to its having traveled in a straight forward position without turning over. The majority of meteorites however travel in a tumbling fashion and are not carved into a symmetrical form.

Chondrules: For the great majority of the stony meteorites, chondrules are an important identification mark. These are rounded bodies of various sizes which differ from sand grains and from all other rock structures to some extent. They resemble oolitic structures more closely than any other feature of terrestrial rocks. Generally, chondrules are of many different sizes in the same stone. They may be so small as to require a lens to see them, or they may be as large as several millimeters in diameter. A common size is like millet seed.

In some meteorites such as the Richardson, these chondrules are loosely embedded in a fragmental matrix so that on a broken surface they stand out conspicuously. In others, they break with the matrix, in which case it is often necessary to polish a small surface in order to see them. A 10-power hand lens is usually sufficient.

While the great majority of known stony meteorites are chondritic there are several varieties which are not. Therefore this is not an absolute test.

The Nickel Test: Another test is the test for the presence of nickel. In metallic meteorites, in the stony-iron forms, and in all of the chondritic meteorites so far examined, nickel is present. The best method in testing for nickel is known as the di-methyl-gloxine test. Take a stony sample and crush it finely with a mortar. Boil in dilute nitric acid for about two minutes and cool. Add ammonium hydroxide to render the solution alkaline, and filter. Treat the filtrate with a few drops of di-methyl-gloxine. If nickel is present, a bright pink color will develop. The test is a delicate one and will reveal the slightest trace of nickel.

There is no single test which can be applied to all meteorites, and doubtful specimens should be submitted to a specialist.

ARIZONA AGATE — JASPER — PETRIFIED WOOD

RARE AND BEAUTIFUL — VIVID COLORS — JUST AS NATURE MADE THEM

SPECIAL SALES OF FINE GEM AND SPECIMEN MATERIAL

With moss, ferns, flowers, trees, flames and many other pictures.

Colors are reds, purple, greens, golden, pink, whites, clear, black and many other colors and mixed colors that make beautiful gems for rings, bracelets, pendants, brooch pins, ear bobs, and other.

SPECIAL

Something new, Arizona opalized agate jasper plume sprays priced at \$2.50, \$4.00, \$5.00, \$7.50, and \$10.00 each.

SPECIAL SALE — Order number 9

2 slices of blue gem chrysocolla these have gem malachite mixed in and are beautiful. 1 slice of gem tiger eye choice of genuine golden, red or bluish green, this is not dyed, please state second choice 1 slice of gem picture petrified wood. 1 slice of gem high color petrified wood. 1 slice of Arizona gem agate. 1 slice of Arizona gem jasper. 1 slice of Arizona banded gem agate. 1 slice of Arizona gem fern and flower agate, some call this plume. 9 slices of beautiful gem material that is rare, these are large slices, and are worth many times the price we are asking, all 9 slices for \$26.00 and postpaid. Limit one order to each customer.

Beautiful ends and chunks from gem and specimen geodes of agate, jasper, petrified wood, each sawed on one side, 5 large ends for \$15.00, 5 small ends, \$10.00. Choice sawed ends of moss, fern, flower, trees and picture from \$2.00 up to \$10.00 each.

PICTURE PETRIFIED WOOD IN THE ROUGH

Number 1 gem picture petrified wood \$10.00 per pound, 2 lbs. \$18.00.

Number 2 gem picture petrified wood \$6.00 per pound, 2 lbs. \$11.00

Number 3 gem picture petrified wood \$4.00, 2 lbs, \$7.00.

Good picture gem petrified wood in small chunks 15 pounds \$15.00 or \$1.00 per pound.

Number 1 gem high color petrified wood \$3.00 per pound, 2 lbs. \$5.00.

Number 2 gem high color petrified wood \$2.00 per pound, 2 lbs. \$3.00.

Book end or ash tray wood 25 lbs. \$15.00, 50 lbs. \$25.00, 100 lbs. \$40.00.

Tree specimen petrified wood with bark showing, 50 lbs. \$22.50, 100 lbs. \$40.00. Without bark showing 50 lbs. \$15.00, 100 lbs. \$25.00.

Beautiful petrified wood chips 5 pound box \$6.00; 10 pound box, \$10.00.

Beautiful Pueblo Indian chips from Arizona agates and jaspers with moss, ferns, flowers of many colors, mixed and solids, 10 chips \$3.00, 20 chips \$5.00, 50 chips \$10.00.

5 pounds of low grade mixed gem material \$3.00, 10 lbs. \$5.00. This is nice cutting material, and 1 pound will cut from \$10.00 to \$20.00 worth of fine looking gem stones.

SATISFACTION GUARANTEED POSTAGE, EXPRESS & FREIGHT EXTRA

CHAS. E. HILL 2205 N. 8th ST. PHOENIX, ARIZONA

HILLS ARIZONA AGATES AND JASPERS

SATISFACTION OR YOUR MONEY BACK

Ferns, Moss, Plume, Flower, Iris, Banded, Clear, Milky, and Pictures, with beautiful bright colors, just as nature made them. All Arizona agate and jaspers come from mines owned and operated by no one but **Chas. E. Hill**.

NO PRICE LIST

From now on I will have no price lists, just send \$5.00, \$10.00, \$25.00, or any amount, be sure to tell me just what you would like, rough or sliced gem material, the quality, the colors, the size chunks, the kind, like scysocolla, malochite, agate or jasper, iris agate, banded and so on, we have all colors, we have gem geodes sold in slices, halves or chunks, we also have some amethyst crystals, turquoise, petrified wood, opal and opalized gem, and many other kinds of rough gems.

GEM TESTED

Each and every chunk is tested for gem quality before shipping, so from now on all gem material will be of a finer gem quality. My agate and jaspers break smooth and slick and take a fine lustrous polish that will last for years without scratching, the hardness runs from 6 to 9.

NEW GEM STOCK

We are mining new gem material from place of formation on my claims at all times, so we should have a fine gem stock to select from on hand from now on. Chunks will be sawed or sliced to order.

SORRY

I haven't had time to answer all the nice letters you folks have written me, telling how beautiful and how well you like my Arizona agates and jaspers. I have more than I can do filling orders, and working my agate and jasper mines, please remember that I do all this work myself.

THANKS

To all who have ordered gem material from me, and thanks for all the nice things you say about my flower, fern, moss, and picture agates and jaspers with the many beautiful colors, I like them myself and think they are the best in their class.

SATISFACTION OR YOUR MONEY BACK

To everyone who has written me asking about the kind of moss, ferns, plumes, flowers, pictures and colors, of my Arizona agates and jaspers, well all I can say is they are more beautiful than I can describe, the flowers, moss, ferns, and pictures are there you don't have to take a second look, they are easy to see, and the colors are bright and beautiful. Anyone who is not satisfied just return the order complete within 5 days and I will refund your money, you pay the postage.

SPECIAL NOTE

Some people think they can send to another state or dealer and buy the same agate and jasper or some just like it, but this is not true. I own the mines and work them myself, no state or no one unless they have bought from me have exactly the same gem material with the same colors, moss, ferns, and flowers, I have many different kinds and colors of agate and jaspers all coming from my mines.

RARE BEAUTIFUL GEM

Anyone who wishes to obtain the choicest and rarest most beautiful flower and fern of beautiful bright colors, send \$5.00, \$10.00, \$25.00 or up for the finest, rarest, choice slices, if you are not pleased your money will be refunded

POSTAGE & EXPRESS EXTRA

CHAS. E. HILL

2205 N. 8th ST.

PHOENIX, ARIZONA

FINE WYOMING JADE

(Gem Quality - Minimum Waste)

Medium Green - - - \$ 8.00 lb.

Light Green - - - - \$10.00 lb.

Dark Green - - - - \$ 4.00 lb.

Black - - - - - \$ 4.00 lb.

Cabachon blanks 1" x 1" x 3/16" - 50c

Sweetwater Agates - - - - - 10c
or 15 for - \$1.00

Ring Blanks of:

}	Petrified Wood	} 25c each
	Turritella Agate	
	Dinosaur Carnelian	

Dinosaur Gastrol'ths (Gizzard Stones) — 35c each

Nature's own polish in dinosaur's gizzard

★ MONEY BACK GUARANTEE ★

Frontier Handcraft Shop

139 So. Wolcott St. Casper, Wyo.

Attention Rock Collectors Everywhere!

Let's make a date to meet at the

KEN-DOR ROCK ROOST

419 So. Franklin St.

Modesto, Calif

VISITORS ARE ALWAYS WELCOME.
We buy, sell or trade mineral specimens.**THE RADIOACTIVE CLOCK**

From page 5

deformed schists and sands with an undeterminable age. If this dike were located in association with Ordovician rocks, it would constitute evidence of prime importance because it would enable exact dating of the Ordovician formations.

Below are listed the seven best established dates in the geological time scale:

Late Cretaceous - - - -	60,000,000
Gilpin Co., Colorado	
Early Permian - - - -	230,000,000
Oslo, Norway	
Late-Cambrian - - - -	400,000,000
Gullhogen, Sweden	
Late-Pre-Cambrian - -	620,000,000
Katanga, Belgian Congo	
Mid Pre-Sambrian - -	1,420,000,000
Keystone, S. D.	
Early Pre-Cambrian - -	1,800,000,000
Carelia, Russia	
Early Pre-Cambrian - -	2,300,000,000
Winnipeg River, Manitoba	

Because of the geological importance of "rock-dating" every effort should be made in the future to determine ages of formation that have not been heretofore examined. We may depend upon the uranium minerals to serve as an invaluable aid to geologists in this work.

50 Ring Stones, including genuine and synthetic	\$7.50
Synthetic Rubies or Genuine Garnets, \$1.25 per carat.	
Cameos or Opals—Genuine, 12 for	\$3.75
100 Jewelry Stones removed from rings, etc., \$2.40; 50 large ones, \$2.40.	
12 Articles Antique Jewelry, rings, pins, etc.,	\$3.00.
500 Costume Jewelry Stones,	\$2.00.
B. LOWE, HOLLAND BLDG., ST. LOUIS, MO.	

IDAHO GEM MATERIALS

PICTURE PLASMA, something new, a variegated colored plasma — takes a high polish, suitable for gems and polished specimens. **SAWED SLABS** 25c to 50c PER SQUARE INCH.

IRIS AGATE, sawed slabs only, complete sections — **WRITE FOR PRICES**

PLUME AGATE, from noted Succor Creek locality — **50c LB. AND UP.**

NODULES, from noted Hog Creek and Grouse Creek deposit — **HALVES OR WHOLE, 35c EA., AND UP. 50c LB. QUANTITY LOTS.**

AGATIZED AND OPALIZED WOODS — **50c LB. AND UP.**

APPROVALS, send for approval assortment of slabbed gem or specimen material. **SEND \$1.00 DEPOSIT ON APPROVALS.**

WE SELL LAPIDARY EQUIPMENT AND SUPPLIES. AGENTS FOR FELKER DI-MET RIMLOCK DIAMOND SAW BLADES.

TRY OUR SERVICE

LAY-ART GEM SHOP

2620 IDAHO T.

BOISE, IDAHO

Revised Lapidary Handbook

by J. Harry Howard

Successor to the author's HANDBOOK FOR THE AMATEUR LAPIDARY. Completely rewritten. Much enlarged — 225 pages. About 70 illustrations. Modern techniques. Much new material never published before. Excellent cloth binding. Good index,

PRICE \$3.00 POSTPAID

Order from your book dealer, lapidary supply house, the author, or this magazine.

J. Harry Howard

504 Crescent Avenue, Greenville S. C.

One carat syn Sapphire brilliants - rivals the diamond - \$7.00 pair,, \$3.75 as singles. 12 x 10 mm syn Ruby oval, top-faceted base - unequaled ruby lights, \$6.00. Synthetic Ruby and Blue Sapphire for cutting - 100 carats - \$8.00 each. Syn Sapphire - 100 carats - \$5.00. Ruby and Sapphire rod, \$0.50 per inch. Selected agate gems, \$6.00 per dozen. Agate pendants and brooches, \$3.00 to \$5.00 in sterling silver. Agate rings - large stones - \$3.00. Gold rings, \$6.75 to \$10.00. Nevada turquoise - 25 carats lots - 30 cents per carat. These stones are not backed. Good Nevada stock requires no backing. Turquoise rings and earrings to order. Argon bulbs, 60 cents. 250 watt blacklight bulbs, \$1.75. Flourescent and luminous paints, 4 oz. \$1.25. All prices F. O. B. Wilmington, Delaware.

C. F. MILLER

18 West 39th St.

Wilmington 220, Delaware

ALL ITEMS POSTPAID

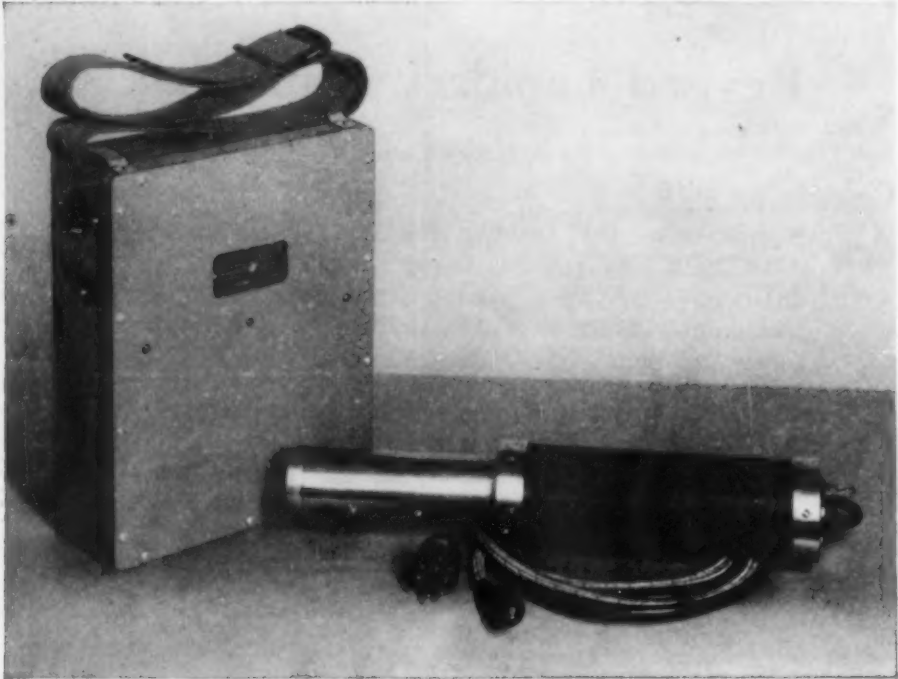
10 roughed in cabochons ready to sand and polish; Group No. 1 includes only stones suitable for jewelry making; No. 2 includes jewelry and specimen cabs; each group \$2.25. When reordering No. 2 please list stones sent on previous orders to avoid duplication. All stones labelled.

New shipment of Mojave Desert jaspers sent in by our own field party. These are not culls. Very colorful, including banded and mottled patterns. Brilliant polish. Each piece sawed on one side so you can see what you are getting. \$1.20 per pound; 3 lbs., \$2.75.

Flowering obsidian, large and small flowers. 1 side each piece sawed. \$1.20 per pound; 3 lbs., \$2.75. Takes brilliant polish.

SATISFACTION GUARANTEED OR YOUR MONEY REFUNDED

ARTHUR & LUCILLE SANGER - 1922 Newport Ave. - Chicago 13, Ill.



GEIGER COUNTER FIELD UNITS

We can now furnish three models of these field units. The price range is as follows:

Model GLP-214	- - -	\$145.00
Model GLP-215	- - -	\$185.00
Model GLP-216	- - -	\$175.00

Model GLP-214 is equipped with headphones for checking Gamma ray intensity by audible "clicks". Model GLP-216 is equipped with a rate meter. This makes possible quantitative computation of comparative radiation. Model GLP-215 is furnished with an electro-mechanical recording clock. All units will detect radiation equivalent to that emitted by .00002 milligrams of radium. This is the least amount of radiation that can be detected:

HOW TO ORDER

Mail check or M. O. for unit plus postage to cover shipment of twenty-five pounds. Unit will be forwarded within forty-five days after receipt of order. Orders will be filled in the sequence in which they arrive.

OMAHA SCIENTIFIC SUPPLY CO.

P. O. BOX 1750

OMAHA 4, NEBR.

FOR SALE

Montana Agates in 100 pound lots
Mixed large and small. \$35.00 per
100 pounds F. O. B. Terry, Montana.

RAHL'S AGATE STORE

Box 445 Terry, Montana

SPECIAL

10 Arizona Mineral Specimens, Geode,
Thunderegg, etc. \$1.00 F. O. B., Cash
with order.

L. E. BAGG

Box 782 Peoria, Arizona

OKLAHOMA BARITE ROSE ROCK

Nature's own formation of intricate
petals of rose. Extremely interesting
and novel. Superb cabinet specimens
at \$1.00 per pound, or five pounds for
\$3.00 pos.paid. Wholesale prices to
dealers.

BERRY LANKFORD

1137 S. W. 38th St., Oklahoma City, Okla.

**AUSTRALIAN
OPAL**

All kinds and colors including Black
and White Fire-Blue Green and mis-
cellaneous.

These are cut stones for collectors.
All sizes and prices.

Also have some fire opal chips or
boulder rough at \$1.00.

Naomi Charlton

Rt. 7

SPOKANE 12, WASHINGTON

**Agate Cutting and
Mounting****R. L. McCLAFLIN**

Chinook Hotel

Box 240 Kelso, Wash.

Genuine Cerium Oxide

Sell or Trade

1-pound lots\$2.50
5-pound lots at 2.00
10-pound lots at 1.90

Will trade for choice cabinet speci-
mens. Write what you can offer.
Cerium oxide rates as the superior
polishing powder

SERVICE LAPIDARY CO.

1308 W. 42nd St., Des Moines 11, Iowa

**AGATE JEWELRY
CABOCHONS
HANDWROUGHT MOUNTINGS****W. F. Thomsen**

Rt. 3, Box 44
Oregon City, Ore.

MINERAL COLLECTORS!

We have just received several thou-
sand pounds of flourescent New Jer-
sey minerals which are offered for
sale at \$1.00 a pound.

Send for listings of minerals, fossils
and archaeological items.

Col. Fain White King

Wickliffe, Ky.

Gem material, Cabinet specimens, Sawed
slabs, Cut stones, Silver jewelry, Floures-
cent materials, Mineral books, Lapidary,
Gold and Silver work to order.

The Colorado Gem Co.

BAYFIELD, COLO.

— MINERALS —

Collection of over 1500 specimens, large variety, partially labeled as to source of deposit.

Red Vermont Jasper available for ornamental stone and novelty work. State sizes and quantity desired.

FORREST L. PARMENTER

BOX 454 CHARLESTOWN, N. H.

Arizona Minerals

Moss Agate, small pieces, 85c per pound.
PINK BANDED or Solid Blue, 50c per lb.
 Red or mustard colored Jasper, 35c per lb.
 Thick walled Geodes, uncut, 4 for \$1.00
 All Agates in the rough. Also other
 Arizona specimens. Postage Extra

MARY ANN KASEY

BOX 230 PRESCOTT, ARIZONA

W. L. DeVANEY

Manufacturer of Agate Jewelry

TOLEDO, OREGON

Sawing, Polishing Specimens

Cabochon sets of all shapes

What? You can't get that odd sized cabochon mounted because it doesn't fit a factory-made mounting? Why worry? Send it to me. I will make a mounting to fit the set!

STERLING OR SOLID GOLD

All Work Guaranteed Satisfactory.

Nevada Gems & Minerals

Carnelian Agate	Sulphur
Black Obsidian	Realgar
Cinnabar in Opal	Orpiment
Cinnabar in Chert	Tourmaline
Petrified Woods	Epidote
Jaspers	Nevada Wonder Stone
Turquoise	Crystallized Spar
	Rhodenite

Rock Garden, Patio and Building Rock
by car load lots

Write for wholesale and retail prices

When going through Battle Mountain, stop at the Nevada Hotel and see our display.

C. A. HOLLIDAY

Battle Mountain Nevada Box 234

Michigan Specimens, Rocks and Minerals Sold, Traded, Exchanged. Wait till fall for big general announcement. Same high quality and good service. We will have more equipment and help to serve you.

Hiawatha Rock & Mineral Shop

Werner J. Vletzke

R. F. D. Rt. 1, Box 10

RAPID RIVER, MICHIGAN

In Hiawatha National Forest

Notice to Advertisers

Our Advertisers are respectfully reminded that the advertising deadline is the tenth of the month preceding date of issue. All ads for the September issue should be in our office by August 10th. We will mail rate card upon request.

NEW POLAR FOSSILS

From page 4

or among whose specimens they were found. The one named for the writer is a mollusk shaped like a scallop with closed shells about a half-inch across. It is evidently a pseudo-form, there being no actual shell material, but the tiny shell wrinkles are perfectly preserved. Most of these fossils were given to the Museum, where they're now on exhibition, and later Prof. Schuchert wrote a professional paper describing them.

Explorer Hall was no scientist and knew nothing of paleontology, hence his collecting—like our own—was haphazard and very incomplete, which accounts for the new species we brought back. Hall returned, after publishing his book, to continue his search for traces of the Franklin Expedition, being financed by Henry Grinnell, at that time president of the American Geographical Society, of New York City. But, in his subsequent search, he did not again visit this deposit. And to this writer, it has since been a matter of deep regret that our party members did not include a qualified fossil expert, during our explorations of this evidently very rich deposit.

At the time, it struck the writer as remarkable that this hill, so permeated with fossils, should be standing there by itself, for we found no trace of any elsewhere in the vicinity. Since then, after a study of Baffinland geology vide: **Geography of the Polar Regions**, Norden-skjold & Mecking; **American Geographical Society-Special Pub. #8, 1928** it seems probable that the "Mount" may be a remnant of a formerly extensive area of Ordovician sediments that happened to be left after severe glaciation. That ice sheet has vanished leaving a few hanging glaciers in the eastern fringe of gneissic intrusives and the sole remaining ice cap, which occupies about one hundred miles of the tongue of land between Frobisher Bay and Hudson Strait.

All this coastal area was sub-marine land in Silurian times, as was also the coast of Labrador and the New England States east of the Appalachian Range; so the Ordovician limestone fossils are marine fauna, with none or at least very few of land fauna. Geologically, the Baffinland region is a north extension of the Archaen intrusives fringed by Ordovician sediments that occur along the coast of the continental northeast. A good example are the limestones surrounding the Adirondak Mountains and northern New York State. They also

extend from southern New England up through the Vermont Mountains and eastern Labrador, and across Hudson Strait into eastern Baffinland.

There, the marginal gneissic intrusives range from beneath the Grinnell ice cap across Frobisher Bay and Cumberland Sound, and thence northwesterly toward Pond Inlet and Bylot Island. Westward lie the crystallines of the Canadian Shield—and in part Paleozoic sediments adjoin, according to Dr. Ludwig Mecking. He further states that these sediments are limited to the northern and central regions and consist almost wholly of Silurian limestones. All the central and west-central parts of Baffinland is a low flat plain, according to Eskimo reports. Few details are known, except that the second lake, **Nettiling** (Esk.) is connected with Foxe Basin by a tidal river thus making it a tidal lagoon. The central plain extends southward to the island's southwest corner, Foxe Land, which is a higher foreland with Silurian limestone cliffs fringing a narrow beach.

The eastern marginal mountain system has an average elevation of from 1,500 to 2,500 feet south of Cumberland Sound, but the height lessens along the shores of Frobisher Bay to finally merge into the central plain. North of Cumberland Sound, the coast range gains elevation up to 5,000 feet, but becomes lower toward Pond Inlet.

It can be seen that glaciation was heaviest in southern Baffinland. Along Hudson Strait, the coast and off-shore islands show rounded and polished rock surfaces, with underdeveloped stream valleys, terraced lakes, and typical striae, that seem as fresh as though the result of very recent glacier action.

All these coastal areas to the south and west are ice-free in summer months, save for the small "Cap" on Meta Incognita. All of this open land then has a vigorous growth of grass dotted with the pale-yellow arctic poppy, dwarf buttercup, small white daisies, many low bushes and stunted willows, five types of saxifrage, three species of *Salix*, also *Draba*, *Potentilla*, *Vaccinium uliginosum*, *Cassiope tetragona*, and various kinds of tall flowering weeds. Tundra encircles the interior lakes covered with matted arctic moss, which affords finest of grazing for immense herds of Barren-ground caribou.

In Cockburn Land, the north end of the island, herds of musk oxen are reported by Eskimos. Polar bears are numerous everywhere, also white wolf and fox, blue fox, arctic hare, lemming,

ptarmigan, snowy owl, small birds from the south that nest here, also the blue goose, and falcons, ravens, all types of sea birds, snow bunting and so on. The ermine is abundant too; also all the polar sea fauna and fish. We caught cod in the bay, and large sea trout in streams and lakes. All of which has little to do with Ordovician times, but is included to prove that a scientist can be sure of a plentiful meat supply.

And from this brief outline of glaciation, and geology that still lacks detailed study, it may readily be seen how one is led to the supposition that the Silliman deposit may be a post-glacial remnant of former extensive fossil areas. Should an expert paleontologist in future visit this deposit, taking time to examine it properly, his findings undoubtedly would vastly extend present knowledge.

And in recent years, access to this region has been greatly simplified. At the time this writer was there, the sole method of transportation from the States was by ship; preferably the bark-rig steam sealers of the Newfoundland sealing fleet, for which a charter party alone cost \$50,000. But they were sea-worthy and dependable.

That was six years before the Wrights flew the first plane at Kittyhawk. Today, using our fast cabin planes, such a flight can be easily and comfortably made with all impedimenta, from such a Canadian airport as Montreal; for summer days up there are 18 hours long, and the airline distance from Montreal is somewhat less than 1,500 non-stop miles. If necessary, extra fuel could be obtained at Battle Harbor, or Domino Run, on the Labrador coast north of Bell Isle Strait.

A modern amphibian plane can carry such a party, with tools and supplies, for a two-month exhaustive examination of the "Mount", including as much of the vicinity as may be thought advisable. Also, for relaxation, there is plenty of wonderful hunting and fishing.

JADE IN COLORADO?

A recent field party which visited the mineral locality at Hahn's peak in northwestern Colorado reported finding small bits of gray-green nephrite. This arouses speculation that a large deposit may lie within the immediate vicinity, but until a more detailed investigation can be made, it wouldn't be advisable to make any predictions concerning the potentialities of this jade.

GOLD is Where You Find It!

Nevada leads in minerals. 700 kinds are found in Nevada. Turquoise — Opals and other Gem Stones. Send \$5.00 for 36 samples of minerals. \$10.00 for 3 lbs. of rough gem stones in assorted sizes.

Both rough and cut gem stones for sale. — Write:

HURRY BACK TRADING POST
GOLDFIELD, NEVADA

Wholesale Stamps, Coins, Curios,
Gems, Minerals
Pictures and Maps of the Far West.
Mining Claims and City Lots for Sale
Cheap.

PHOTO CONTEST

In order to secure photographs of the highest quality for our cover we have decided to offer the following prizes for the best photos of subjects that would interest the earth scientist.

First prize \$5.00

Second prize 3 year subscription.

Third prize 1 year subscription.

All photos should be on six by nine high gloss paper and should be accompanied by the name and address of sender. Photos which are found unusable will be returned if requested.

FORTIFICATION AGATE

Visitors to the badlands of South Dakota this year will find it worth their time to stop in at Scenic, S. D. where the lapidary shop of Thomas Freit is located. Mr. Freit, who was one of the first persons to settle in this picturesque locale, has on display a number of beautiful polished badlands agates. He also has a large collection of fossils from the nearby Oligocene beds.

FOSSIL COLLECTORS!

Send dime for our new catalog

OMAHA SCIENTIFIC

Box 1750, Omaha 4, Nebraska

PAPER SHORTAGE

Due to the critical paper situation which exists at the present time we have found it necessary to delete several articles from this issue. The September issue, however, will be complete and will contain about twice as many pages. It will feature an article about the new Australian opal deposit. This article should be of special interest to gem cutters because the opal market will be greatly affected by this new source of replenishment for the world's dwindling opal supply. Also featured will be an article by Victor Shaw, dealing with minerals in Colorado. This article gives a comprehensive discussion of all noted mineral localities in Colorado and includes instructions for reaching these locales.

The November issue will feature an article about the new GEM COLONY at Bayfield, Colorado. Also in this issue will be an article of interest to California mineral clubs.

HAUSER BED GEODES and agate nodules from the Little Chuckawalla Mountains in the heart of the desert.

Some of the specimens contain drusey quartz, clear quartz or amethyst crystals. Solid clear and fortified agate in white, blues and reds. Beautifully colored matrix. In sizes up to 2½ inches diameter, 25c each.

Also Mexican onyx (carbonate) beautifully colored and veined. Makes exceptionally beautiful book ends, ash trays, desk sets, etc - 50c a pound. Hundred pound lots as wholesale prices.

We have everything in equipment and supplies for the amateur lapidary.

Gem Arts

4286 Marlborough

SAN DIEGO 5, CALIFORNIA

CLASSIFIED ADVERTISEMENTS

Rate 5c per word. Minimum advertisement \$1.50. All ads must be in our office on the tenth of the month preceding date of issue.

GEMS AND MINERAL SPECIMENS

SPECIAL: 2 pounds of colorful Oregon beach gem cutting agates and jaspers - \$1.25 per lot postpaid. Thunder eggs 50c per pound plus postage. Less in larger quantities. Polished halves from \$1.00 up. Sawed but not polished 75c. Petrified wood 50c lb. Will do your diamond sawing 10c per square inch. Lee Stradley, 8325 S. E. Mill St., Portland 16, Oregon.

GEM CUTTERS. Beautiful Agatized Wood, many colors, two pounds \$1.00. 30c postage. Also Fossil Grass and large Selenite Crystals at same price per pound. Write: L. Manning, Hettinger, N. Dakota.

GENUINE OZARKS CUTTING AND CABINET MATERIALS - Rose and green jasper-agates-blue and brown chalcedony-red jasper-white onyx-banded and mottled flints-calcite-vari-colored breccias-cherts-drusy and milky quartz-crystal clusters-coquinas-crinoids-collite-etc. 5 lbs sent postpaid for \$2.50. John Jennings, Eureka Springs, Arkansas.

SPECIAL - 10 Arizona Mineral Specimens, Geode Thunderegg, etc. \$1.00 F. O. B. Please send cash with order. L. E. Bagg, Box 782, Peoria, Arizona.

MINERALS - GEM STONES - FOSSILS - COINS-BILLS-STAMPS-BOOKS - GLASS - BUTTONS-CURIOS-Quartz crystal 15c, Flourite 25c; Zinc 15c; Lead Ore 15c; Bauxite 15c; Iceland Spar 15c; Moss Agate 15c; Catalogue 5c. Cowboy Lemley, Las Cruces, New Mexico.

OKLAHOMA BARITE ROSE ROCK - Nature's own formation of intricate petals of rose. Very interesting and novel. Superb cabinet specimens at \$1.00 a pound or 5 pounds for \$3.00 postpaid. Wholesale prices to dealers. Berry Lankford, 1137 S. W. 38th St., Oklahoma City, Oklahoma.

FOSSILS

IOWA UNDER THE SEA! Prehistoric sea fossils as collected from the prairie clay hills of Iowa, twenty-five assorted specimens for \$1.00. Postage paid in the U. S. and Canada. Glenn Michell, Rockford, Ia.

WORM BORED WOOD - INTERESTING petrified wood showing the borings of Teredo worms prior to silicification. Gathered along the Oregon coast beaches. Large and small specimens, price 25c per pound. Postage extra. No order for less than \$1.00. F. F. Watson, General Delivery, Toledo, Oregon.

1946 Victory Catalog Now Available

This 64-Page illustrated catalog costs 40c per copy to produce. For this reason we are asking you to send 20c in coin for your copy. It contains a detailed listing of - LAPIDARY EQUIPMENT AND SUPPLIES; SILVER IN MANY FORMS (SHEET, WIRE, BEZEL); JEWELRY FINDINGS; BROOCH, PENDANT, AND RING MOUNTINGS; ROUGH, PREFORMED, AND POLISHED GEMS; FLUORESCENT LAMPS AND MINERALS; BOOKS; MAGNIFIERS; RING MANDRELS; MISCELLANEOUS SUPPLIES FOR THE JEWELER AND GEM CUTTER.

GRIEGER'S
1633 EAST WALNUT

Gems and Minerals
PASADENA 4, CALIFORNIA

Geologists Wanted

The U. S. Civil Service Office has announced that there are a number of openings for geologists in the Panama Canal Zone. Inquiries should be addressed to the U. S. Civil Service Commission, Washington, D. C., or to your local U. S. E. S. office.

Mr. Meier Leaves for Ceylon

Ernest Meier, well known importer of gems, will leave for Ceylon, India sometime next month. Mr. Meier whose well known establishment in Church St. Annex, New York City has done business with thousands of cutters and collectors, will be missed by all who have known him. As soon as it is available, this magazine will publish Mr. Meier's Ceylon address.

A COMET STRIKES THE EARTH

by H. H. Nininger

This little book is one of the most interesting publications concerning meteorites that has come out within the past few years. The book explains how to recognize meteorites, how to collect them, and interesting facts about them. With each book is included, without charge, one genuine meteorite from the famous "Barringer Crater" at Canyon Diablo, Arizona.

WRITE NOW FOR YOUR COPY

Book complete with meteorite from
Barringer Crater - - - only 50c

Send your order to:

H. H. NININGER

BOX 32 — FLAGSTAFF, ARIZONA

or this magazine

DIRECT FROM THE MINE

ARAGONITE: Beautiful, unexcelled for bookends and novelties. Tough — flawless — easy to work. Takes high polish and is flourescent. 15c a lb. Minimum order \$2.25.

RED VARIEGATED JASPER: Very choice. Minimum 10 pounds. 50c per lb.

WONDERSTONE: Exquisite colorings and markings. Nothing more beautiful. Minimum 10 pounds at 60c per pound.

Above items F. O. B. Express. Special prices per ton.

MOLDAVITES (Tectites so called). Beautiful for cabochons, beads, etc. \$1.50 per doz., postpa'd.

Also select single specimens of **KALINITE: ALUNITE: ORPIMENT: REALGAR: WONDERSTONE: SILVER: STIBNITE**, etc. Minimum orders, \$3.00.

Send your check and state sizes and what you want. Prices will be right. Also have those huge **ARAGONITE PYRAMIDAL XLS.** weighing up to 65 pounds; unknown to occur elsewhere.

C. C. BOAK — TONOPAH, NEVADA

NAVAJO INDIAN SILVERSMITHS

We have expert Navajo silversmiths making jewelry to order. Rings, bracelets, pendants, brooches, earrings, etc. Have your cabochons mounted in coin silver mountings.

We also do commercial rock cutting of all kinds. Our stock includes both raw and finished picture petrified wood and turquoise cabochons, petrified wood slabs, Navajo and Zuni handmade jewelry, rugs and other Indian crafts.

Wholesale and Retail.

Prices on Request.

ART'S GEM SHOP

Main Office — West Y

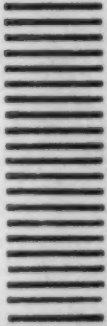
Store No. 2 — East Y

BOX 225 — GALLUP, NEW MEXICO

THE INDIAN CAPITOL OF THE WORLD



BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 865 SEC. 510 P. L. & R. OMAHA, NEBR.



The Earth Science Digest
P. O. Box 57
Omaha 3, Nebr.

Please send THE EARTH SCIENCE DIGEST for the period indicated below
— 12 issues per year. Bill me later.

1 yr. \$2.00 2 yrs. \$3.75 3 yrs. \$5.00

Name.....

Address

City..... Zone..... State.....

ADDITIONAL POSTAGE PER YEAR: CANADA SOC: FOREIGN \$1.00

➔ Use MINERALIGHT

- ... *for pleasure*
- ... *for beauty*
- ... *for research*
- ... *for profit*



MINERALIGHT literally adds another dimension of untold beauty to mineral and gem collections ... enables the scientist to establish mineral identities quickly and accurately by fluorescent color response ... materially aids prospectors and hobbyists in the field to identify many minerals, such as Scheelite, Mercury, Uranium, Zircon, at a glance.

➔
Send for 16 page, 4 color catalog and learn how this ultra-violet (black-light) lamp permits fluorescent analysis ... at home, in the laboratory and in the field!

SAVES TIME AND COSTLY ASSAYS

And MINERALIGHT enables geologists to determine oil content of fresh cores and rotary mud on sight! It, literally, has thousands of uses! 16 MINERALIGHTS in 5 MODELS ... 110 Volt A. C. lamps for laboratory use ... 6 Volt battery lamps for field use.

ULTRA - VIOLET PRODUCTS, INC.

5205 Santa Monica Blvd. — Dept ISD — Los Angeles 27, Calif.

MINERALS

Large stock — Choice items for collector and for study — We specialize in crystals. Send for list.

Tourmaline Pencils — California 10c, 15c, 20c, 25c each.

Selenite Crystals — loose, perfect, 10c to 50c each.

FOSSILS

We specialize in Pennsylvanian age fossil collections. Plants and invertebrates available. Lists available soon.

10 select identified fossils, \$2.00.

Eocene Fish Chubs \$5.00 Herring \$7.50.

GEMS

We stock numerous varieties of rough and cut gem materials.

Blue banded agate nodules — \$1.00 lb.

Brecciated Jasper — California — \$1.00 lb.

SLABS, CUT STONES, PREFORMS — sent on approval.

WRITE FOR ILLUSTRATED CATALOGUE ON LAPIDARY EQUIPMENT

BOOKS

Quartz Family Minerals - - 2.50 Gems and Gem Materials - - \$3.00

The Rock Book - - - - \$6.00

A POSTCARD PUTS YOU ON OUR MAILING LIST

GRAFFHAM'S COMMERCIAL MUSEUM

421 ASH

OTTAWA, KANSAS

STERLING SILVER

Sheet — Wire

Chain — Findings

IT IS OUR PLEASURE TO ANNOUNCE

NEWEST IN FACETING HEADS - THE ALLEN HEAD

Designed and built by those who know facet cutting best. The ease with which this head works makes it a pleasure to facet gem stones.

\$36.75

Metal dops to fit facet head

3/16 in.	Pair - -	.90
1/8 in.	Pair - -	\$1.25
3/8 in.	Pair - -	1.00
1/4 in.	Pair - -	.90
3/16 in.	Pair - -	.90
1/8 in.	Pair - -	.90

We also have the "V Blocks" for transferring your stones from one Dop to the other, thus assuring that your upper facets are correct in relation to the lower facets.

\$3.95 each

SPECIAL

Indian design hand stamps for stamping silver

\$1.25 each

Sterling silver Earscrews
#51s - 50c pair, \$2.10 doz.

SPECIAL

Nickel silver pintongs 1 1/2, 2, 2 1/4"
40c doz. \$1.20 gross

Nickel silver joints (to fit above)
16c doz. 35c gross

Nickel silver safety catches
\$1.00 doz. \$5.25 gross

The store will be closed for vacations August 19th to 31st

ALL PRICES F. O. B. LOS ANGELES

R. & B. ART-CRAFT CO.

11017 South Vermont Avenue

LOS ANGELES 44, CALIF.